Reaching Out to Teachers and Students

When was the last time you were in a school classroom? Some of us may conjure images of our most recent in-service training or the college lecture hall we once occupied for a semester. For many of us though, schools and teachers are a distant memory or a point of dinner conversation with our children. However, the structured learning environment of the classroom is where much of our fundamental knowledge was gained and many of our basic views were shaped. Through schools and teachers, information reaches our society in one of the most accepted and positively reinforced venues.

Education of the public on the natural role of fire and the prevention of unwanted wildland fires is becoming increasingly important as communities encroach on wildland areas. Arson and debris burning are the leading causes of escaped wildland fires in intermix areas. Education is the key to prevention of these types of fires. It is also key to a better public understanding of the benefits of prescribed and natural fire.

Why Reach Schools?

Reaching teachers means reaching students. Students are still in the process of developing their knowledge and belief structure, and contacting them through the school system is a good opportunity to communicate with them and their parents. Another benefit of reaching out to school audiences with your fire ecology message is that it allows you to tailor your message to a uniform audience. Such focus in content and approach can result in more effective communication and potential shifts in attitude and behavior. In addition, developing relationships with communities and schools improves the public image of the agency or organization you represent.

Teachers are a direct conduit to students. They are the information facilitators with whom our children spend a great deal of their structured learning time. Working with teachers will enable you to access their expertise in child behavior and development as well as their knowledge of curriculum needs and requirements. With the aid of teachers, your message can be shaped into an age appropriate and contextually grounded part of the students' experience.

Professional educators have a wealth of information that can assist in the development of your school program. They can also guide you to more adequately address the needs of schools and teachers, which will result in much wider success for your program efforts. Also, teachers are ultimately the best source of advertising for your program once it is implemented. Teachers in schools around the country are under immense pressure to meet education standards for curriculum development. Teachers are charged with meeting increasing requirements within the limited time frame of the academic year. For the most part, teachers are seeking innovative ways in which to access information relevant to their curriculum guidelines. Sharing wildland fire managers' expertise and professional knowledge

within a classroom allows teachers to connect their students with information that is not always readily available to them. Building relationships of mutual respect among teachers and wildland management professionals benefits the professional development of the educators and enhances their ability to most effectively teach students.

One of the most time-consuming tasks in the education process is putting vast amounts of information into an understandable and appropriate format for instruction. Lesson plans and subject units are carefully constructed by every teacher. Teachers will benefit from your efforts to present your fire ecology message in a manner that addresses their needs and is readily adaptable to their framework. Students, too, have much to gain from your message. An effective school program will reinforce the materials students have encountered in their studies and provide a tangible experience with "real life" people and issues. Contact with professionals from outside the traditional school environment lends a certain credibility to academic concepts and allows students to make connections within their growing knowledge base. It also benefits students by exposing them to a diversity of teaching influences and styles.

Reaching out to teachers and students with information on wildland fire and fire ecology concepts can be a daunting task. Teachers, students, and you, the manager/scientist/communicator, all stand to benefit greatly from the development and implementation of a school program; however, this requires significant planning and a unique understanding of the needs and expectations of all parties involved. Among other things, communicators are looking for effective transmission and understanding of their messages. Teachers are looking for a quality learning experience that meets standardized criteria and is relatively free of logistical hassles. Students, too, have expectations that are directly related to their developmental age and prior experience with the topic and nontraditional educators. As you embark on this often lengthy process, remember the three elements—students, teachers, and the communicator—that are involved. Keep your goals balanced with those of teachers and students.

Making Contacts

There are three main steps to developing and implementing a school program. First, you must contact schools and gather input from educators. Then you will be able to work with teachers to develop appropriate materials to be infused into the existing curriculum. Finally, you will be ready to market your product and begin programming.

When you begin reaching out to a school or district with your ideas for wildland fire education, it is helpful to research your agency's history of involvement with educational outreach and the reputation schools may associate with your program. Building on bridges already constructed can be a great way to jump-start your project and may enable more open communication with schools and communities. Talking with other communicators about program development strategies and ideas is another important starting point. Park rangers, media specialists, public affairs officers, interpreters, or other members of your field may have important tips on working with schools in your area. Check with local park districts to see what has been done and what is being done in related areas of conservation/environmental education outreach to schools.

While gathering this general information, it is most important to establish contacts with a target school or district. You may use personal contacts if you are familiar with a school in your area. Contacting a science teacher is a logical first step in gaining access to a school; however, you will soon realize the benefit of navigating the bureaucratic chain of command within the schools. In this planning process, always include the school principal and any

other administrators who work with curricular issues. In some areas, this includes parents, subject coordinators, or other teachers and schools from the same district. Forming a team to address program development can be an effective way to invite participation with your project. Whether you limit your sources to the principal and a teacher or two, or you call an open meeting for all interested parties, you will want to distribute a letter of introduction outlining your background and proposals. Be sure to include both personal and agency information and the goals of the project you are interested in developing.

Working with a stakeholder group of interested parties can be a valuable and transformative experience. The program almost always benefits from the meeting of minds that can occur in a collaborative atmosphere. Again, no matter how many people you include or whether you are able to even meet in person, the process of giving a voice to all parties interested in your programming will help to ensure your program's success. If planning field trips to your site are what you had in mind, it could be worthwhile, for instance, to know in the early stages of program development that schedules only permit three hours away from school during the day. Your partners can meet (electronically or otherwise) a couple of times to check in on the program's development or work can be shared among the stakeholders to tap into various skills within the group. The nature of the partnership can grow from the interest level and time commitments of those involved.

Developing Your Program

Once you have made initial contacts within the school system, you are ready to garner advice on program development. Utilize your contacts to determine the school programming needs. At this point you may be thinking of accessing students by visiting classrooms once or several times during the course of a school year. Maybe you are interested in sponsoring a field trip and then providing supplemental wildland fire activities for teachers to conduct with their classes. Another option you may consider is developing materials for teachers to incorporate directly into their classrooms.

Often, teachers receive only a packet of information with which they are expected to create a comprehensive lesson or unit of study for their students. Your efforts should make the next step— connect teachers and students with wildland fire materials and ensure that they are readily implemented and accessed to their fullest potential.

Developing the curriculum (the complete set of activities, materials, and background information for your school program) is the next step. However this process relies heavily on gathering information and advice from a variety of sources. You may want to contact the State Board of Education to get copies of the education standards publications for your state. Schools and teachers are required to organize their curriculum around the achievement of these goals. Most states' guidelines are similar to the National Education Standards; however, it is often the state standards (and sometimes local district or even school level standards) that directly guide the curriculum development. These documents will outline to a greater or lesser extent which concepts are expected to be covered at each grade level from kindergarten through high school. Eventually, your wildland fire message may be organized into a series of programs to meet the standards of several grade levels—emphasizing different aspects of wildland fire with each grade. Therefore, knowing which standards your program meets will help teachers place it in their lesson plans; it is also a great marketing advantage. Several environmental and fire education materials are already organized to meet some of the goals outlined by existing wildland education guidelines.

The education standards are typically organized by academic subject, so reviewing the science publication may be most appropriate. However, do not limit your programming aims to the subject of science. Often, programs can meet requirements in several subjects with just a little ingenuity. Increasing the interdisciplinary appeal of your program by meeting requirements in English, mathematics, or social studies as well as science will make it more marketable to teachers working in groups or teaching multiple subjects. Schools in which students move between classes often find it difficult to accommodate a program that disrupts the schedule. Marketing the multi/interdisciplinary aspects of your program can overcome such barriers.

Translating your message to fit into standardized education guidelines is not a difficult process. You will find, in fact, that wildland fire concepts fall neatly into the generalized language of the education standards. However, as mentioned previously, the standards are often written for each grade level and compliance is mandatory. Your program development, too, should follow these guidelines. Avoid designing a universal set of materials and attempting to adapt it to various grade levels. The differences in physical, mental, and emotional maturity, and in vocabulary level between a primary student and a middle school student are vast, to say the least. Your presentation and/or materials are your chance to tell your story to a relatively homogeneous audience. Choose a grade level (or a cluster of grades) and develop a program specifically for that age range. Then, when utilizing your materials, teachers will identify which age range addresses the needs of their students.

For the most effective message, use any information you can find on child development. Students have world views that are often different from those of adults. Therefore, you must have unique content, methods, and expectations for younger audiences. This is true for all school groups, but not the same for each group. Development in children implies an ongoing process. Preschool and primary grade students are more egocentric. Animate and inanimate objects merge, and time and sequence concepts are difficult to comprehend (Tevyaw and Reilly, 1991). In programming for this audience, the focus must therefore be on the experience. Alternative perspectives are hard for these students to grasp, and relating your story to that which is already familiar to your audience is fundamental.

Students in secondary classrooms (nine- to twelve-year-olds) have a much greater ability to understand intangible concepts, but still benefit greatly from constructing meaning through interaction with physical objects or social activity. That is, demonstration is much more effective than narration. Adolescent audiences are unique as well. An excellent resource for programming for each of the above age groups is the National Park Service's "Programming for School Groups: An Interpreter's Guide" (Tevyaw and Reilly, 1991).

Generally, for most school groups, some basic guidelines for environmental education do exist. Anytime your message can be tied to students' life experiences and place in time, the program is more successful. Students should be able to interact with the resource as well. If your agency has easily accessible land under a fire management program, field trips that bring the students to the resource are an option. Field trips often require a bit more logistical navigation — permission slips, transportation costs, extended time away from classes — but a well designed and marketed program can draw teachers and administrators past these barriers. Another environmental education guideline for the classroom or the field is making the learning experience multisensory. Hands-on, minds-on learning through activities that draw on all senses and a variety of learning styles will be more effective for more students.

When planning to visit a classroom or to meet with students directly, keep in mind another useful concept in environmental programming: creating a sense of companionship rather than direct instruction. Sharing in an exploration and guiding discovery can be much more rewarding, especially when working with students who have few disciplinary problems.

Once you have an idea of the content of your program, it is important to develop pre- and post-visit activities — those sequential activities that can be administered by wildland fire personnel or teachers. Insuring that students are prepared for your message allows you to make the most of your time with the class. Providing activities and plans for study prior to your visit (pre-visit or advance organizers) will allow teachers not only to ready their students for concepts you will present, but it will give teachers a framework, or lesson plan, in which to place your program contextually. This step is important whether or not you are actually visiting the class.

All activities convey messages more effectively if placed in a context and processed by the learner. Preparatory activities can be as simple as a vocabulary list or detailed experiments and projects for students to complete. (See Discovery Pictures Study Guide in this *Guide*.)

Follow-up activities allow students time to process or apply their knowledge as well as to complete the lesson or unit for the teacher. These can include writing assignments (multi/interdisciplinary appeal) for individual processing or group projects or other opportunities for evaluation.

There are numerous sources for age-appropriate activities to include in your program or to offer as pre- or post-visit material. Activities can range from the discussion oriented, with few materials, to craft and creativity focused, involving many supplies and equipment. By researching the sources available, you can develop programs that blend more costly supply-laden activities with easy activities requiring little preparation. Because classroom budgets vary from school to school, be sure to include a variety of activities in your information for teachers.

Materials appropriate to the audience you are targeting and the localized ecosystems you are discussing may already be developed. A variety of fire education activities and resources are included in the resources section of this guide. These

resources are a starting point and will lead you to other useful materials.

A final piece to your curriculum development is the opportunity for evaluation. Allowing a formal mode of response to your program will give teachers the opportunity to continue input in your programming. A brief questionnaire with room for suggestions will affirm the teachers' roles in your outreach efforts as well as give an opportunity for feedback. Be sure to provide the evaluation form to teachers with the initial packet of materials, and prior to your contact with the students (with pre- and post-activities or materials) if you are visiting the school. This will improve the teachers' abilities to thoughtfully reflect on your program. Some educational resources offer sample forms for you to adapt to your curriculum, but often the most useful evaluations are ones that you create based on questions you have and decisions you need to make. Don't be afraid to put some thought into the evaluation forms for your program. They are a valuable source of program development information. You may want feedback, either formally or informally, from students as well. Be sure to work with teachers on the wildland fire program evaluation. Often they appreciate the assurance that the evaluative information will be used only for your own program development.

Marketing Your Program

Once you have one or more educational programs or activities developed with the input of your school contacts, your are ready to market the results of your wildland fire efforts. Creating a situation in which teachers seek your program materials for their classrooms takes a bit of proactive outreach on your part. County or local government can provide you with the names of school districts in your region. Marketing your program can be modeled after the media kits described (see "The Role of Media Packets in Public Information and Education" in this guide). Including several one-page fact sheets for teachers in a packet mailed to the school principal will allow easy dissemination of the basic information to many teachers with one mailing. Be sure to include detailed contact information with directions for leaving a message for you — teachers often have little time near a telephone during the day.

Improving the efficiency of your marketing strategy will allow you to spend more time on programming. Some things to consider: target schools and districts in which your program fits the established curriculum goals or develop the multi/interdisciplinary aspects of your programs to broaden their appeal. In other words, once your programs are ready for presentation, begin working with the schools that will most easily adopt your program. After you begin distributing your materials and/or visiting classrooms, constant program improvement based on the feedback you receive from evaluation material will be important to maintaining school relationships and creating new ones.

Mailing literature on your program in the form of a newsletter or a brochure is the fastest way to get the word out. As mentioned earlier, teachers will spread the word among other schools and classrooms. Other strategies for broadening your program base include presenting or displaying information at academic conferences teachers attend. Just as with other professions, teachers can be reached by advertising in professional journals as well. Your early contacts can help you determine appropriate avenues of this nature for the educators you are trying to reach.

Inviting local press coverage of your early program efforts will help reach other teachers and parents as well. Contact the local public affairs officer in your agency to have a press release distributed. Remember to consider the needs of the teachers and students involved — it may be most appropriate to invite press coverage of your "behind the

scenes" efforts and your general message rather than intruding on the classroom experience itself.

You may offer to present a teacher's workshop or in-service at individual schools whose faculty show particular interest in your message. Giving teachers an idea of what to expect in your programming and the messages you will bring to their students will enable them to more easily incorporate a program into their lesson plans. It also will help them help you during your programming, either by assisting in activities or relating your activities to their classroom experiences.

If you are visiting the classrooms to present your message personally, there is no need to walk teachers through the activities you have compiled for presentation. However, the workshop could be an appropriate place at which to offer some of your pre-visit materials in order to generate a sense of cooperation and enthusiasm. If you are supplying a packet of materials for teachers to implement on their own, the workshop is the time to teach the teachers how to use the materials you are sharing. In this case, conducting the activities with the teachers can allow an opportunity for teachers to thoroughly understand the wildland fire message and the value of its place in their curriculum. Contact administrators as well as teachers in order to identify and prevent roadblocks to your effort. Schools should see wildland fire program development as a collaborative effort to broaden their students' experience and benefit the curricular goals in place.

Implementing Your Program

At this point, you have worked with teachers, communicators, content specialists, and administrators to develop your wildland fire program, and you have advertised it to schools and teachers. Implementing and personalizing your programs require significant attention to detail. Whether you are distributing a wildland fire packet or preparing to visit a classroom, logistical matters involving time and budget constraints, and administrative requirements must be considered. Each school operates uniquely and will require personalized attention. Your peace of mind and the quality of the program experience will be vastly improved by addressing these issues with each class that expresses interest in your message and materials.

When a teacher makes contact with you about your wildland fire materials, get to know his or her expectations and needs, as well as the class profile. If you will be visiting the classroom to conduct activities with the students, determine whether there are any students with special needs who require specific accommodation. Ask the teacher about supervision and chaperones during your program. On a field trip, one adult for every ten students is a minimum. When visiting a classroom, ensure that the teacher will be present during your program. No one wants your message to be disrupted because of disciplinary problems. If you will need any audiovisual equipment, or even if your are bringing your own, communicate this with the teacher as well. Find out if there are any time or spatial constraints for the class — you do not want students to leave for lunch halfway through your visit.

Understanding the class's profile, or readiness to learn, is also beneficial. If time allows, this can be ascertained via mail with a stamped, self-addressed simple questionnaire included in your pre-and post-program materials. Knowing the students' current understanding of fire and prevention, as well as what has already been covered in class, will allow you to supplement rather than duplicate the learning experience. Ask about the particular class curriculum objectives that your material or presentation can meet.

If you are conducting an in-class presentation or field trip, you are embarking on a personalized communication experience. Practice beforehand and have all of your props and visual aids organized and at hand. While interacting with students, an important aspect to your program is the creation of a sense of companionship rather than direct instruction. This is a special event for the class as well as for you. Seeing it as a shared adventure exploring new concepts can build on the students' anticipation and sense of excitement.

The following are some selected examples of the wide variety of curriculum materials available for wildland fire programming. These resources can be used as inspiration for creating your own activities and programs, particularly when they focus on an ecosystem different from your own; or when the activities are more general or oriented toward your region, they can be included as modules in your program. Remember when drawing from these and other educational resources that individual activities do little to affect student learning. Your successful fire program will consist of an integrated series of learning experiences that can be embedded in the teachers' existing curricula across academic subjects. Each of these sources is listed with a contact, ordering information, and a brief description of its contents. Also included is a sample activity representative of each publication.

References

Louisiana Department of Agriculture and Forestry. 1996. "FIRE! A Teacher's Guide to Fire Ecology in the Southeastern United States." Adapted from Yellowstone National Park, "Getting to Know Wildland Fire."

National Wildfire Coordinating Group. 1996. "Wildfire Prevention, Conducting School Programs Guide."

Smith, J., N. McMurray, L. Thomas, and J. Walsh. 2000. The Fireworks Educational Trunk: Hands-on learning about fire ecology. Restoration Ecology (in press).

Tevyaw, K. and P. Reilly (coordinators). 1991. *"Programming for School Groups: An Interpreter's Guide." National Park Service, North Atlantic Region, Division of Interpretation*.

Author: L. Kate Wiltz

Wildfire Prevention, Conducting School Programs Guide

National Wildfire Coordinating Group, March 1996

Contact:
National Interagency Fire Center
Attn: Great Basin Cache Supply Office
3833 S. Development Ave.
Boise, Idaho 83705
*Order NFES #*1254
Web page: http://www.nwcg.gov/pubs/pubs.htm

Grade levels: Pre-K through 12

This guide is one in a series published by the National Wildfire Coordinating Group on wildfire prevention. It addresses methods and ideas on how to enhance the delivery of wildland fire prevention and safety messages. It is a good supplement to this guide's section on developing and implementing your program. The first half of the booklet offers tips to the communicator entering the school setting. Subject headings in this section include: Understanding the Educational Setting, The Teacher's Input, Knowing Your Target Audience, Handling Problem Students, Presentation Skills, Audiovisual Aids, and Handling Unsolicited/Unplanned Requests. The tips for success provided in this section are organized pragmatically. Specifically looking at programming for audiences at the preschool level through the sixth grade, it also introduces strategies for junior and senior high school audiences. It offers valuable information on the behavioral development and learning capabilities of young audiences. Part 2 of this booklet offers just five activities for the preschool/elementary audiences; however, it is followed by a sample evaluation form for distribution to your audience (the teacher).

WILDFIRE PREVENTION PROGRAM EVALUATION

We would appreciate it if you would take a few moments to fill out this evaluation sheet and return it within five days to: {Name, Agency and Address} Thank You.

Question	Response		Comments
1. What is the age and grade level of your students?	Age Grade		
2. Is the lesson appropriate and/or effective for this age and grade level?	Yes	No	
3. How many students are in your group?			
4. Do you feel that your students understand the concepts that were presented?	Yes	No	
5. Was the lesson plan delivered in a manner that was easy for your students to understand?	Yes	No	
6. What was YOUR response to the program? Please score using a scale of 1 to 5 where 1 = poor and 5 = excellent.	Score		
7. What was your students' response to the program?	Score		
8. Would you be interested in having our agency visit your school again?	Yes	No	

Continued Next Page

9. Name of your preschool or school:		
10. Address of your school:	Street:	
	City	Zip
11. Your name:		
12. School phone number: ( )		

We are looking forward to the response about our program from you and your students. We value your opinion, and your comments will help us to continue improving our wildlife prevention program. Please return this form within the next five days. Thank you for participating in this evaluation. We appreciate it!

Your comments on the overall program will be appreciated.
(Use additional sheets of paper if needed)

Bell LIVE! Fire and the Forest Curriculum

Bell Museum of Natural History, University of Minnesota, 1996

Phone: (800) 923-5548
Web page: http://www.umn.edu/bellmuse/mnideals

Grade levels: 5 through 8

Bell LIVE! is an annual program that covers a different theme each year. Through its innovative distance learning team at the University of Minnesota, teachers and communicators can access a live broadcast on the year's topic and coordinate it with activities provided in the curriculum booklet. In 1996, the theme was education on forest fires and their effect on ecosystems. The entire curriculum offers 21 activities or lessons organized into a pre- and post-broadcast format. The wealth of activities can easily be adapted for use without the video (available at the above web site). The information and activities are further divided into sections on forest conservation, fire and the forest, and forest management. The middle section's activities may be most applicable to the fire communicator's school visit; however, any number of these activities would suit the pre- or post-visit material. Lessons in this booklet are designed to meet National Science Education Standards as developed by the National Science Teachers Association for grades five through eight. The program presented by the Bell Museum's curriculum balances management views and the importance of fire to forest ecology with education on the prevention of unnecessary wildland fires.

Lesson 12: Prescribed Burns — Fighting Fire with Fire

Background

Control Burn

What the Indians
here
used to do, was
to burn out the brush every year,
in the woods, up the gorges,
keeping the oak and the pine
stands
tall and clear
with grasses
and kitkitdizze under them,
never enough fuel there
that a fire could crown.

Now manzanita,
(a fine bush in its right)
crowds up under the new trees
mixed up with logging slash
and a fire can wipe out all.

Fire is an old story,
I would like,
with a sense of helpful order,
with respect for laws
of nature,
to help my land
with a burn, a hot clean
burn
(manzanita seeds will only
open after a fire passes over
or once passed through a bear)
And then
it would be more
like,
when it belongs to the Indians
Before.

by Gary Snyder

American Indians have understood the beneficial and natural role fire plays in ecosystems for thousands of years. After learning our lesson from the consequences of years of fire supppression, we understand that some ecosystems *need* to burn for their health and survival.

In today's society, fires cannot be indiscriminately set, nor can they be allowed to burn unchecked.

Fire management uses fire, in the form of prescribed burns, as a tool to bring about change in an ecosystem that mimics the effects of wildfire.

Prescribed burns, or controlled burns, are small fires that are purposely set under highly regulated conditions and allowed to burn within a planned, geographic area. Special care is taken to consider the safety of people and property. They are planned in advance to achieve a specific objective in a specific area under appropriate weather conditions and at the right time of year. Fire equipment and fire crews are used to keep the fire under control.

- During the broadcast, you will be witnessing a prescribed burn. Its purpose will be to remove the *slash*, or the branches, twigs, and other woody debris left on the forest floor after a *time harvest*, or logging operation. Study the "9 Steps to a Successful Prescribed Burn" outline and the "Anatomy of a Prescribed Burn" diagram to familiarize your class with the procedure.

Prescribed Burn Uses and Benefits

- improve wildlife habitat
- enhance native plant communities
- reduce fuel loads that contribute to wildlife hazards
- prepare seedbeds for fire-resistant species such as jack pine and red pine
- remove woody debris left on the forest floor following logging operations
- discourage the growth of exotic species or other undesirable species

These are all natural consequences of wildfires that humans can duplicate with controlled fire. Or can they? The very fact that the fire has to be controlled is contrary to nature. However, with today's increasingly complex integration of civilization and natural wilderness, it may be as close as we'll ever get.

9 Steps to a Successful Prescribed Burn

1. Choose the Site

Identify a site with a natural firebreak such as a creek or a road. Create a map of the site that includes fences, gates, power poles and lines, streams, wetlands, roads, trails, nearby buildings, and other important features. Also note the types of vegetation on the site.

2. Season

Choose the time of year to conduct your burn. Early spring and late fall are the best time to do prescribed burns in northern Minnesota.

3. Prepare the Site

Before the burn, clear the area of anything that should not be burned. Create firebreaks where natural ones such as streams or roads do not exist, so the entire site is contained within firebreaks. Firebreaks can be created by mowing, plowing, or bulldozing a line around the edge of a site.

4. Gather Crews and Equipment

The number of people needed for a fire crew depends on the size of the fire. People are needed for the ignition of the fireline, for the control of the fireline to ensure it doesn't *escape* or jump the line and get out of control, and people are needed to *mop up*. Assemble *drip torches* for ignition, backpack sprayers, shovels, and rakes for control, and axes and chainsaws for mop up. Be sure to have a pumper truck with a high pressure hose on hand in case the fire gets out of control. Two-way radios, first aid kits, fireproof clothing, hard-hats, and drinking water are also important. Safety is as important at a prescribed burn as it is at a wildfire. Every prescribed burn runs the risk of getting out of control.

5. Permits and Notification

You cannot perform a prescribed burn without a permit from your state Department of Natural Resources, Forestry Office, or the town fire chief. Notify the DNR, local fire departments, law enforcement officials, and neighbors that you will be conducting the burn.

6. Weather Conditions

Weather is the most important factor in conducting a prescribed burn. The wind speed, relative humidity, and temperature will together determine whether your fire will be safe and controlled, or wild and dangerous. In general, weather conditions should fall under these guidelines:

- wind speed – less than 15 miles per hour
- relative humidity – more than 25 percent
- temperature – lower than 80 degrees Fahrenheit

Even if the weather conditions are right on a particular day, you need to consider the conditions leading up to that day as well. If it has just rained, the fuel my be too wet to burn efficiently. If it has been dry for several days, the fire will burn hotter and faster, and may be more difficult to control. Foresters take measurements of fuel moisture content to determine how efficiently the area will burn.

Wind speed should also be considered, because it will determine which area of the site will be burned first, and it will also determine where the smoke will end up. If the smoke is near buildings and houses, your neighbors will appreciate your efforts if you avoid doing burns when their houses are in the path of the smoke.

7. Conducting the Burn

Recheck the weather conditions constantly on the day of the burn. Reschedule the burn if weather conditions change. Assemble the crew and go over the plan. See the "Anatomy of a Prescribed Burn" diagram on the next page for the procedure.

8. Mop–up

Make sure all burning debris is extinguished before leaving the site. This may require hours of tedious work, but it's better than starting a wildfire. Recheck the site daily for a few days for persistent burning embers.

9. Evaluation

After the burn, inspect the site. Was it successful? Did you accomplish your objective? Was it safe and efficient? Were the firebreaks effective?

Anatomy of a Prescribed Burn

Lesson 12: Prescribed Burns — Fighting Fire with Fire

Journal Entry:

Using the weather section from your local newspaper, keep track of the weather conditions in your area and make notes about which days would be appropriate for burning and which days would not. What would happen if you conducted a burn on a day when the humidity was too low? What would happen if the wind speeds were too high? What if the temperature was too high?

Classroom Activity: Fuel Moisture Content

Objective:

To identify the significance of fuel moisture content in determining the potential success of a prescribed burn.

Materials:

- candle
- paper cup
- matches
- water

Safety Equipment:

- fire extinguisher
- hot pads
- eye goggles

Procedure:

Pour a small amount of water into the paper cup. Light the candle. Hold the paper cup over the candle flame. The water inside the cup absorbs the heat from the flame, preventing the cup from becoming hot enough to burn. The heat being absorbed by the water causes it to evaporate. Once all of the water in the cup has evaporated, the cup will become hot enough to burn.

Discussion:

Moisture inside trees and other vegetation performs the same function. Just after it rains, fuel moisture content is high. After a long period without rain, the sun will have evaporated much of the excess moisture from the fuel, causing it to be very dry. How does fuel moisture content affect a fire? If the fuel moisture content is low, will the fire burn quickly or slowly? Apply this same concept to moisture in the air. Under which conditions will a fire burn more easily – low relative humidity or high relative humidity? Often times, when it rains or snows on a raging forest fire, the rain or snow never reaches the ground. Use the analogy of the water in the cup activity to explain why. (The heat from the intense fire causes the precipitation to evaporate before reaching the ground.)

Extensions:

- Discuss the term *relative humidity*. Relative humidity is the amount of water in the air compared to the amount of water the air can hold at that given temperature. So if the relative humidity is 50%, the air is holding half of the water that it is capable of holding at that given temperature. The higher the temperature, the more water the air is capable of holding. This is why winters tend to be dry and summers tend to be humid.
- Experiment with the burning efficiency of different types of fuels – 1) green branches, leaves, and twigs; 2) dead and dry branches, leaves, and twigs; 3) dead and dry branches, leaves, and twigs that have been "rained on" (sprayed with water); 4) branches and pieces of wood of large diameter and mass; 5) partially burned wood from a fireplace or campsite. Which ones burn easily? Which ones do not? Why? Where and under what conditions can each fuel type be found in nature?

Science Links Module 2: Wildfire!

Everday Learning Corporation

Phone: (800) 382-7670
Web page: http://www.everdaylearning.com/sciencelinks

Grade levels: 8 and 9

This curriculum focuses on scientific processes behind wildland fire, using the Yellowstone National Park fire in 1988 as a case study. Principles from biology, chemistry, Earth science, and physics are applied through hands-on activities for students. Specific concepts covered by the activities include temperature change, heat transfer, chemical change and oxidation, acid/base chemistry, food webs and nutrient cycling, and ecological succession. Some background information on these concepts is provided and would be a great addition to pre-visit materials for teachers. Lessons are divided into three sections: detecting fire, controlling fire, and recovering from fire. The module is accompanied by a video with several short segments meant to facilitate some of the activities.

Fire in Pacific Northwest Ecosystems

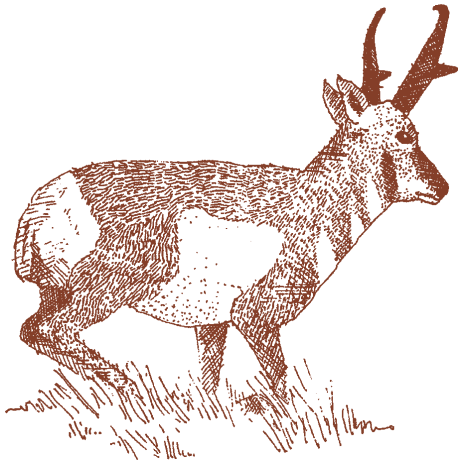
Environmental Education Association of Oregon and Pacific Northwest Wildlife Coordinating Group, July 1997

Contact:
Susan Thomas, Conservation Education Coordinator
U.S. Forest Service
600 Sherbourne
Levinworth, WA 98826

Grade levels: 7 through 12

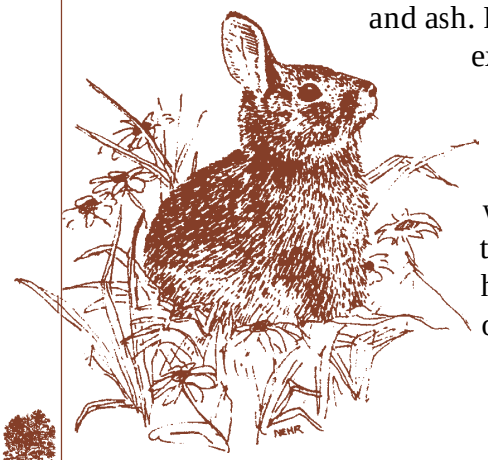
This comprehensive sourcebook is filled with activities for older students. It was developed in response to the growing number of requests for educational materials focusing on the role of fire in the forest systems of the Pacific Northwest. Currently, it is only available to individuals who participate in one of the teacher training workshops (similar to the Project Wild model) given in Oregon and Washington. The curriculum has four sections with activities ranging from games to experiments to discussion-oriented sessions. Section one covers fire ecology concepts. The second incorporates human attitudes and historical uses of fire. In the following section, urban interface issues and the safety and prevention concepts are addressed. The last section of activities deals with fire issues and the controversy surrounding the use of fire as a management tool. Activities are thoughtful and involved; often they direct you to outside resources on wildland fire. The gem of this document, however, is the appendix comprised of fact sheets, case studies, and an extensive glossary of fire-related terms. The twelve one-page fact sheets cover fire effects on various natural communities. The three case studies are in-depth explorations of historic fires (the Yacult, the Tillamook, and the Yellowstone burns). The activities and case studies have many pages for student handouts and overhead transparencies, as well as assessment opportunities with answer keys.

3 Fact Sheets: Fire Effects on Wildlife/Fauna



The effect of fire on animals depends on the type of fire and type of vegetation. Fire in areas of heavy fuel loading tends to be more intense and kills more animals, especially invertebrates and micro–organisms. Generally, vertebrates are rarely killed in fires and where death does occur, it usually has a negligible effect on the species population.

Fire releases minerals into the soil which stimulates plant growth. Animals, in turn, benefit from additional minerals when they eat the new plant growth or the charcoal and ash. For example, snowshoe hares and white–tailed deer have been observed eating the charred bark or ash after a fire.



Unlike those who eat foods found only in mature forests, animals with flexible habits and diets thrive. Birds and animals which require old–growth conditions decrease.

Fire provides habitat for a wide variety of animals by creating a burn pattern (mosaic) that provides diversity in vegetation for wildlife use. The surviving elk, pronghorn antelope, deer, and similar animals will find new pathways for moving to and from water, calving areas, and summer/winter ranges.

Effects of fire on stream habitats:

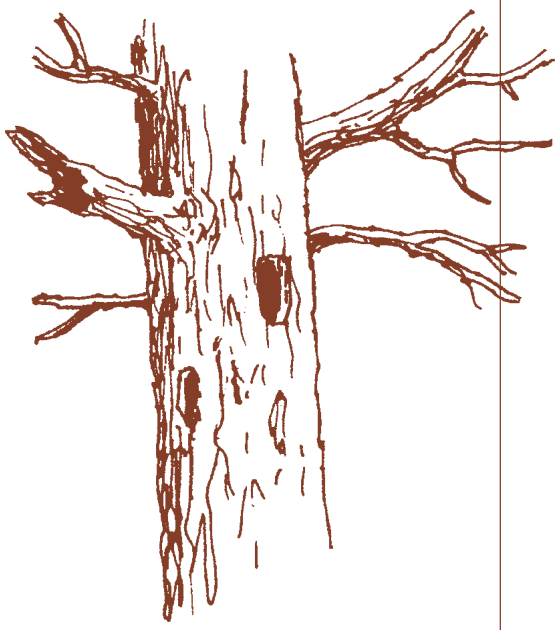
Removal of streamside vegetation often increase erosion (sedimentation) which reduces available habitat and raises stream temperatures.

- Increased sedimentation has several affects on fish habitat:
  - reduces the size of spawning beds
  - deposits fine materials that smother eggs
  - prevents emergence of fry
  - increased turbidity causes fish to have trouble seeing their food
  - reducing resting places as sediment fills up pools

- Increased stream flow may crush or dislodge eggs.
- Higher stream temperatures will decrease oxygen content, increase incidence of fish disease and increase oxygen demand on fish.
- Increased nutrient loading causes increased algae production which results in a more diverse population of insect larvae. This is beneficial if toxic levels aren't reached.

Fact Sheets: Fire Effects on Wildlife/Fauna 3

Effects of fire on invertebrates:



• Invertebrates tend to decrease because the animals or their eggs are killed by flames or heat.

• Fire destroys the sap that keeps bark insects away. These insects soon move into a burned forest followed by woodpeckers and other birds, especially those who nest in cavities.

• Flying insects are attracted to heat and smoke and to killed or damaged trees. Populations of certain species may increase during and after a fire.

• Fire provides immediate food for some insect pests while destroying food that many rely on in the "long run."

BIBLIOGRAPHY

[1]EFFECTS OF FIRE ON FAUNA, U.S. Department of Agriculture/Forest Service. General Technical Report WO-6, 1978.

[2]Fuller, Margaret, FOREST FIRES, New York: Wiley & Sons, Inc., 1991.

FireWorks

USDA Forest Service, Rocky Mountain Research Station, Northern Region

Contact:
Jane Kaplee Smith or Nancy McMurray
Intermountain Fire Sciences Laboratory
P.O. Box 8089
Missoula, Montana 59807
Phone: (406) 329-4803 or 4805

Grade levels: K through 10

This USDA Forest Service curriculum, the benchmark in current wildland fire materials, is accompanied by a "trunk" of materials to be used in the activities. The integrated activities focus on the Ponderosa, Lodgepole, and Whitebark Pine forests. They have inspired the creation of regional curricula by other agencies across the country. Currently the trunks are lent to educators on an as-needed basis, and are circulated primarily in the Pacific Northwest region of the United States. The content focuses on five fire-related themes: the physical science of wildland fire behavior, characteristics that enable plant and animal populations to survive fire, the "fire history" of forests, change in forest communities over time, and people's influences on forests and wildland fire. Props in the trunk include a slide presentation as well as many background readings and supplies for experiments. Many of the activities involve burning in the classroom to investigate combustion processes and fire effects. There is a section on safety considerations in burning indoors. After the numerous classroom and lab activities, an outline for a field scavenger hunt is provided. This curriculum is drawn from principles outlined by the American Association for the Advancement of Science's benchmarks for science literacy and the national science education standards. Opportunities for extension and enrichment activities are outlined at the end of each section as are occasional tips for integrating the fire curriculum into the regular classroom curriculum. Recent research on the use of the FireWorks program with 7th graders demonstrates positive outcomes in the students' understanding of wildland fire, their ability to transfer knowledge from the field to the classroom, and their attitudes toward their classrooms and teachers (Smith et al., in press).

Activity 4–1. What's a Community?

What's the Point? Students describe what they know about human communities and use this knowledge to explore the concept of a biological community. A biological community consists of all the organisms in a particular area that are bound together by food webs and other relationships. A community differs from an ecosystem because an ecosystem contains non-living things as well. Here is a definition of an ecosystem: a biological community and its non-living environment.

After the discussion, students decorate the classroom to depict three different forest communities (dominated by ponderosa pine, lodgepole pine, and whitebark pine) and some of their inhabitants.

Teacher's Map:

Grade level(s): Primary, Elementary

Objective(s): Students can list members of human and biological communities, and describe energy relationships in these communities.

Subject(s): Science, Reading, Speaking and Listening, Library Media

Duration: 30 minutes

Links to Standards:

National Science Teachers' Association — Grades K–4:

C1) Identify needs of various organisms

D3) Understand that the sun provides light and heat to earth

National Science Teachers' Association — Grades 5–8:

B3) Understand that energy is transferred in many ways

C4) Recognize that ability to obtain and use resources, grow, reproduce. . . are essential for life

North American Association for Environmental Education — Grades K–4:

0A) Identify basic kinds of habitat and plants and animals living there

0B) Produce images of the area at the beginning of European settlement

1C) Collect information about environment

2.1A) Identify changes in physical environment

2.2A) Understand similarities and differences among variety of organisms, habitat concept

2.2C) Understand basic ways organisms are related to environment and other organisms

2.2D) Know that living things need energy to live and grow

2.3A) Understand that people act individually and in groups

2.3E) Recognize that change is a normal part of individual and societal life . . . .

North American Association for Environmental Education — Grades 5–8:

0A) Classify local ecosystems. Create food webs

2.2A) Understand biotic communities and adaptations

2.2D) Understand how energy and matter flow in environment

Vocabulary: animal, community, ecologist, ecosystems, energy, plant, species

Materials:

In this trunk. . . .	***. . .where?***	***You must supply***
Feltboard Backgrounds (3)	Teacher Box	Space in classroom to display feltboards
Feltboard Notebooks (3)	Teacher Box	Tacks or tape to hang up feltboard backgrounds
FireWorks Library	Main Trunk	Art materials

Preparation: From the Feltboard Kits, remove the background displays. Pin or tack them up in your classroom, preferably where they can be on display while you use *FireWorks*. The three forest types that you will study occur at progressively higher elevations. Ponderosa pine is at the lowest elevation, along valley bottoms and on warm lower slopes. Whitebark pine occurs on ridges and near mountain tops. Lodgepole pine grows in the middle but overlaps with both of the other species. Try to depict that in your displays by locating the three beltboards next to each other, with lodgepole slightly higher than ponderosa and whitebark even higher. Another way to do it would be to have a student volunteer sketch a mountain slope and label the drawing to show where the different kinds of forest occur.

Plan student work teams and assignments. Three teams (2 or more students each) will assemble the feltboards. If you wish to display some of the books in the *FireWorks Library* in your classroom and have students borrow them while you are using the curriculum, ask another team to "assemble" the Library. If this leaves some students without tasks, assign them to examine one book from the *FireWorks Library* and prepare a poster for the classroom depicting something they learn in it.

Procedure:

1. Give each feltboard team a kit and show them which background to work on. Ask them to assemble the feltboards to look like the photo in each kit. Ask them to label each feltboard with the laminated sign in the looseleaf notebook and to find out, by reading or by asking someone who can read, what the name of the forest is and where it occurs (high in the mountains, near valley bottoms, or in between).
2. Ask the Library team, if you are using one, to arrange the *FireWorks Library* books.
3. If some students are making posters, arrange for them to borrow books from the Library.
4. Assign some seat work for teams who finish while others are still working.
5. When the classroom is decorated, ask students to be seated for discussion.

Guided Discussion — What is a Community?

6. **For Primary Students**, hold this discussion as a "circle time" or "storytelling time."
   For Elementary Students, record information from students in a chart on the board or on a flipchart: Make three columns – "Community," "Human Community," and "Forest Community." During the discussion, fill in this chart with concepts like those shown in table 9.

7. Ask if anyone can explain what a community of people is. You could ask a student to find a definition in the dictionary.
8. Ask for descriptions and examples of human communities. Write community-related concepts, such as *inhabitants, place, birth, having babies, obtain energy, change,* in the left column of the blackboard chart. Write students' examples from human communities in the middle column.
9. Ask what a forest community might be. As the discussion develops, write examples in the right column.
10. Explain that the study of living things and their environment is the work of *ecologists*.

Evaluation:

Name one plant and one animal that lives in a forest community. Where does each of them get energy for life?

Closure:

Ask each feltboard team to tell the class what kind of forest is shown and where it occurs.
For Elementary Students: Point out that forests are much more complicated than the feltboards show. Moist places, for instance (in creek beds and on north slopes), have different kinds of trees and wildlife. Examine and discuss the moist sites shown on the feltboards.

Table 9. Similarities between human communities and forest communities. Use for guided discussion in Activity 4–1.

Community	Human Community	Forest Community
Where? a particular place -- almost any size and shape	city, town, school, church, club family, class	mountainside, valley, meadow huge wilderness
Who lives there?	people	hundreds of kinds of plants, animals, fungi, and other organisms
	They get into the community through birth and moving in; they leave it by dying or moving out.	
All need energy. How do they live?	They have to have food. Most adults grow their own food or work for food. Human communities also use fossil fuels, water, wind, and sunlight for energy.	Plants use sunlight energy directly. Animals obtain energy from plants or by eating other animals. Hundreds of species, including many fungi, decompose ("recycle") dead material so its nutrients can be used again.
Change	Human communities change constantly–people are born, grow up, and die. Buildings are built and torn down. Roads and businesses change. Storms, fires, and floods change the community.	Forests too change constantly. Plants grow and die, animals come and go. Storms, floods, and fires cause some dramatic changes. Other changes are so slow that it is hard for humans to notice them.

Getting to Know Wildland Fire:

A Teacher's Guide to Fire Ecology in the Northern Rocky Mountains

National Park Service and U.S. Forest Service

Contact:
Bob Fuhrmann
Environmental Education
P.O. Box 168
Yellowstone National Park, WY 82190

Grade levels: 4 through 8

The activities in this guide are an accompaniment to another publication for teachers, "Expedition: Yellowstone!" This earlier curriculum for grades 4 through 6 is available at the above address as well, and is designed for students who may have access to Yellowstone National Park. However, many of the activities in "Getting to Know Wildland Fire" do not require access to a burned area. The brief document contains about eight activities with handouts to be copied for students. The activities cover a wide range of academic subjects and are a good example of the interdisciplinary opportunities in programming. The materials required for these activities do not appear to be as difficult or costly to assemble as some others. A lengthy list of readings and videos about fire is included at the end of this curriculum.

Activity

To Light a Fire

THEME: Fires will not burn unless specific conditions exist.

SUBJECTS: General Science, Chemistry, Physics

WHEN: Before your Expedition

OBJECTIVE: Students will learn to recognize and identify the conditions necessary for burning.

METHOD: In small groups, students will attempt to burn a variety of fuel types.

BACKGROUND: Fires need heat, fuel, and oxygen to burn. Remove any of these elements, and a fire will go out. In the northern Rockies, lightning provides a ready source of ignition. Fuels in the form of dead and down trees accumulate at a steady rate because the process of decay is slow in this region. However, conditions in Yellowstone are usually much too cold and wet to achieve large-scale, sustained burning. The drought of 1988 (conditions unprecedented in the park's 112-year written record) was the key event which turned the tide in favor of burning. Severe drought, accompanied by unusually high winds, fanned the fires to their humbling proportions. In 1988, we witnessed a convergence of conditions which may occur once every 300-400 years. Forest fires burn in a mosaic pattern which is reflective of varying fuel types. Wet meadows and stands of young trees do not burn as readily as old forests with large accumulations of litter.

MATERIALS: Matches (enough for five per group), five buckets or boxes containing varying fuel types (keep the amount of fuel in each bucket small).

Bucket #1: A good assortment of sizes of fuels, some with needles, all green.

Bucket #2: Same as #1, but fuels should be dead and dry.

Bucket #3: Same as #2, but fuels should be damp.

Bucket #4: A good assortment of fuels, all partially burned.

Bucket #5: An assortment of fuels, all of a large diameter (small surface area to volume ratio – i.e., no kindling).

Plastic one-gallon containers filled with water, one for each fire.

PROCEDURE: Begin with a discussion of how a fire gets started and whether it is easy or difficult to start one. Instruct the students that they will be trying to start fires in small groups. It may not be easy! The groups must plan their strategies carefully. They will then try to get as much of their fuel to burn as possible in the allotted time. Read them the following rules:

1. Each group must be under the supervision of an adult.
2. All fires must be built within a designated area (an open playground or parking lot away from buildings would be best).

10 Getting to Know Wildland Fire

3. No fuels may be used other than those assigned to each group.
4. Only five matches will be given to each group.
5. A two-minute group planning session prior to action is mandatory.

After all groups have had ample time (10 minutes should be adequate), call it quits and assemble groups for discussion. Which groups were successful? Why or why not? Visit each fire site and examine differences in fuel types and success of burning. Do these differences in fuel type occur naturally? Where and under what conditions can each be found? Discuss the extreme fire conditions of 1988, and ask kids to hypothesize as to whether or not it could happen again. What other factors besides fuel type come into play? Point out strategies observed, such as blowing on fires. Introduce a fire triangle model. Demonstrate that if any part is removed, the triangle will collapse and the fire will go out.

EXTENSION: Demonstrate burning in a bell jar:
1. Seal the jar with a stopper to cut off the supply of oxygen.
2. Add oxygen to demonstrate ignition of a glowing splint.
3. Observe the fire extinguish itself when the fuel is consumed.
4. You may also remove heat to extinguish by adding water.

After having kids hypothesize how it will burn, burn a glass-encased soil profile. Measure the depth of soil charring. Have them tell you why it didn't burn deeper. Discuss the likely vegetative response. On your expedition, hike to see the vegetative response in a burned area.

Hike to observe a mosaic burn. Hypothesize as to why certain areas did not burn (differing fuel types, moisture content, age of trees, etc.). Point out the value of maintaining a vegetative mosaic.

EVALUATION: Have the kids draw and label a fire triangle.

Grades: 4-8
Duration: 30-50 minutes
Group Size: any
Setting: outdoors, preferably in an open area away from buildings or other flammable objects
Key Vocabulary: hypothesize, litter, mosiac

Fire!

A Teacher's Guide to Fire Ecology in the Southeastern United States

Louisiana Department of Agriculture and Forestry, July 1996

Contact:
Louisiana Department of Agriculture and Forestry
Office of Forestry
P.O. Box 1628
Baton Rouge, LA 70821-1628

Grade levels: 3 through 8

This curriculum is an adaptation of the above, "Getting to Know Wildland Fire." Activities are modified to fit the social and environmental setting of the southeastern states. The nine activities touch on subjects from art and physical education to science and social studies. It contains opportunities for extension, a great fire poster, as well as an age-appropriate glossary of fire terms.

Activity FORESTS, FLAMES AND FIRE FIGHTERS

SUBJECTS: Physical Education, General Science

GRADES: 4-8

OBJECTIVE: Students will describe how fires grow and explain how they are controlled by fire fighters.

DOING THE ACTIVITY:

BACKGROUND: Forest fires start small and can only grow and spread if favorable fuels, heat, and oxygen are available. In windy conditions, embers blown from the main fire can start new fires or spot fires. By removing fuels from the path of an advancing fire, fire fighters can slow a fire's growth. Effective fire suppression can usually be achieved by plowing a fire break using a fire plow attached to a bulldozer. Fire fighters can also slow a fire's growth by using water which robs fire of its heat. Water dropped by helicopters on large forest fires rarely puts the flames out entirely, but it may slow the fire enough to contain or surround it through the construction of fire lines.

SUGGESTED MATERIALS: Yellow construction paper or contact paper for arm bands or badges to designate fire fighters. Plastic flagging tape (available at local hardware stores) to represent the fire breaks. If unavailable, a light rope, yarn, or string on a spool could be used, with caution.

PROCEDURE: Designate 1/4 of class as fire fighters. The lead fire fighter will be the bulldozer. Designate one student as the flame. (The teacher may wish to be the flame the first time through the game.) The remainder of the class will represent trees (or fuel, which allow the fire to grow). At the beginning, explain to the players what each of their roles will be (see Page 4). Have the flame go to one end of the playing area, and align the fire fighters at the other end. Now tell the trees to "take root and grow" anywhere they wish on the playing field. They should stand with their arms held up to mimic tree branches.

4 Fire!

The flame starts the game by tagging a tree. Trees may not run from the fire! Tagged trees become part of the fire, and must join hands with the flame. The fire must now continue its pursuit of trees as a unit, attempting to capture trees with their free hands. Captured trees must join the chain of fire. Fire can either move as a long chain, or may break into several smaller groups and travel as spot fires. The flame will designate where spot fires jump the line. They may not travel as individuals (pairs or more only!). This distinguishes them from the trees.

Fire fighters should be held on the sidelines until the fire has had a chance to "grow" to 3-4 players. At this point, ask the fire fighters, "Do you smell smoke?" They'll be raring to go, so when they yell, "Yes!", allow them to go fight the fire. For safety reasons, insist that the players walk.

The principal method of slowing the fire will be containment, using an indirect attack. (Indirect attack stops the fire by removing the fuel ahead of the flame, rather than by extinguishing the flame itself.) Fire fighters must work together to encircle or contain the fire. The bulldozer and the first fire fighter starts toward the fire. When the bulldozer wishes to start "plowing" the line, the first fire fighters stops at that point to anchor the line. Another fire fighter then moves into position behind the bulldozer. The bulldozer and the fire fighter begin encircling the fire, letting the line out as it goes. If the bulldozer wishes to change directions, the fire fighter stops at that point to "hold the line." Once the fire fighter is in place, he or she cannot move. Another fire fighter then moves into position behind the bulldozer. This continues until the fire is contained. Contained fires must sit down where they are contained.

SUMMARY OF ROLES OF PLAYERS:

TREES: Stand still—you may be captured by the fire or saved by the fire fighters.

FIRE: Tag trees and grow! Avoid containment by the fire fighters.

FIRE FIGHTERS: Save as many trees as possible. Join with other fire fighters to encircle fires and have them sit down.

EVALUATION: The game is over when all of the fire is contained or all of the trees are burned. Compare the number of "fire" players left at the end of the game with the number of saved trees. Who won? The fire fighters or the fire? Why? What factors influence how large the fire gets, or how fast the fire spreads? (Wind, humidity, fuels—grass, pine needles, etc.)

EXTENSION: Play a few rounds to give everyone a chance to play different roles.

1. See the video "Kisatchie Wilderness Fire" or other available videos on wildfires. For a copy, contact the nearest Forest Service office, listed in the white pages under U.S. Government. Replay the game after viewing to see if the outcome changes. How did it change?

2. Have the children draw pictures of how wildfires get started, how they grow, and how fire fighters attempt to control them.

3. Research other forest fire fighting techniques. Compare and contrast with the technique used in the activity.

The fire triangle

Meet the Fire Prevention Team—Good Fires and Bad Fires

The Firehouse, 1993

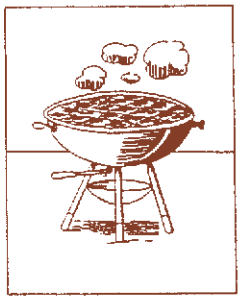
Contact:
National Wildlife Coordinating Group
http://wahoo.dnr.state.mn.us/catalog/products/fire_welcome.html

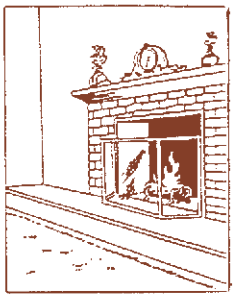
Grade levels: K through 2

This packet is a cohesive lesson for younger audiences that utilizes animated wildlife characters to communicate messages about good and bad fires. The materials seem to have a western United States orientation (i.e., the species used are native to the western states), but should be easily translatable by the communicator into more localized messages. In addition to the animated characters, two flame symbols are used to identify good (a smiley flame) from bad (the frowning flame) fires. The activities revolve around the use of flashcards to stimulate interactive discussion on different types of fire. Activity sheets are included for the students to complete, as is a coloring book and word search, and stickers for the students. The ideas behind this packet are another good example of age-appropriate programming.

The Fire Prevention "Good Fires, Bad Fires" Activity Sheet

Draw a line from The Happy Flame to Good Fires
Draw a line from The Angry Flame to Bad Fires





Ecological Management Issues: Finding a Curricular Fit

"Sorry, my district has a set curriculum."
"I catch enough heat without trying to teach about fire!"
"I just don't feel comfortable adding new material when I usually can't even cover the required topics."
"Project 2061 said, 'The present curriculum is overstuffed.' Now you want me to add something else?!"

Teachers encountering a new set of teaching materials, even when they relate to important issues or valuable skills, may not immediately see them as opportunities. The constraints of formal education are certainly real, and frequent public demands for a certain kind of accountability (primarily measured by increased test scores) weigh heavily in the professional choices that must be made about what is to happen in the classroom.

How can a topic as important as wildland fire ecology find its way into a crowded, overburdened, and seemingly inflexible school curriculum? The problem may not be with the new topic but with the way teachers think about the curriculum. Earth Systems Education (ESE) is an approach that K–16 educators in many countries are finding valuable in rethinking what should happen in science teaching and learning.

ESE was conceived by teachers, scientists, and science educators who believed that the science curriculum could be better related to students' lives if it were to focus on their surroundings, on the Earth itself, just as science was in its beginnings. How natural processes work, how people affect Earth, what things fit together and how, why we can't really separate biology from chemistry from oceanography, and so on—these are the exciting ways of science that few encounter in traditional classrooms. A curriculum focused on Earth offers the possibility of not only teaching sound interdisciplinary science but also making that science relevant enough to be exciting and useful.

To counter the "overstuffed" nature of the curriculum, ESE is based on seven Understandings (ESUs) about what a person completing a good science course, unit, or program of studies should recognize. They are listed here in summary form, however the ESE web site at http://earthsys.ag.ohio-state.edu/framework.html has expansions with examples.

Framework of Understandings for Earth Systems Education

1. Earth is unique, a planet of rare beauty and great value.
2. Human activities, collective and individual, conscious and inadvertent, affect planet Earth.
3. The development of scientific thinking and technology increases our ability to understand and utilize Earth and space.
4. The Earth system is composed of interacting subsystems of water, rock, ice, air, and life.
5. Planet Earth is more than 4 billion years old and its subsystems are continually evolving.
6. Earth is a small subsystem of a solar system within the vast and ancient universe.
7. There are many people with careers that involve study of Earth's origin, processes, and evolution.

Teachers who are considering use of new curriculum materials, such as those in wildland fire ecology, should first examine the curriculum they presently teach. Is it clear from the course materials that these Understandings could come from them? Does that really happen? How often does the work of a day consist of worksheets requiring facts, drawn from books or lectures, as answers? Often a text-based science course will include good representation of science processes (ESU #3) in one discipline,

but does it relate those processes to real things happening in the students' environment (ESU #4) or to how things have changed over time (ESU #5)? Could a student complete a topic in the textbook without knowing how people have explored and used the science or why people need to know it (ESU #2 and #7)? How many students emerge from the curriculum with an appreciation for the wonders and the value of Earth, and a recognition of why those attributes are important enough to express and protect (ESU #1)?

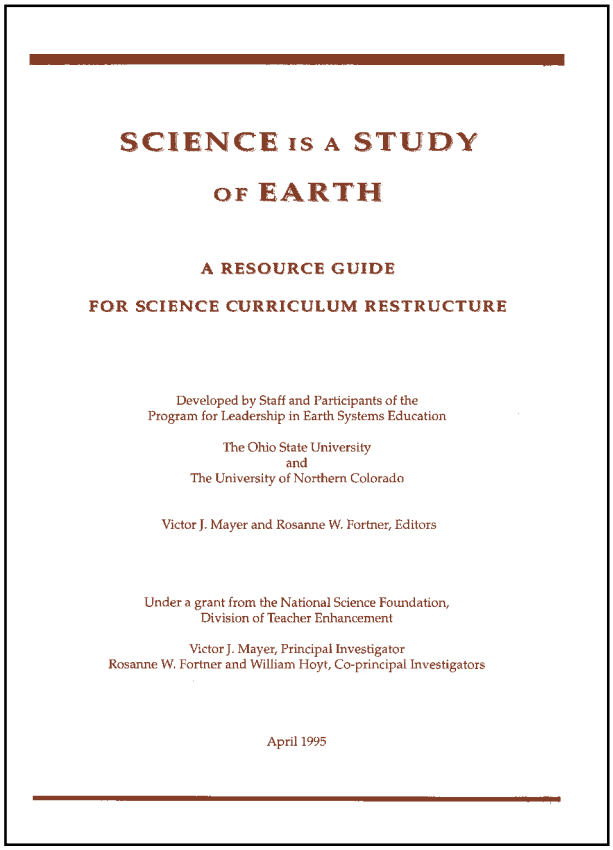
Few existing curricula meet the seven simple expectations of Earth Systems Education, so many teachers in the United States and abroad are taking the steps needed to enhance their teaching with specific attention to the Understandings. They do not see this as more work; on the contrary, making certain that seven things happen is much more manageable than dealing with the large numbers of facts required for most final examinations. They make a decision not to reject their current curriculum but to enhance it with relevant examples and rich, lasting learnings. Research shows that along the way, ESE can enhance science skills just as the modern curriculum requires.

To determine whether wildland fire ecology has utility for the classroom, examine the materials to determine how they could address the Earth Systems Understandings. A key consideration is the "systems" approach to thinking that is stated in ESU #4. Fire ecology clearly is a systemic phenomenon, affecting or affected by atmospheric composition and events, moisture, features of the land, and living things. After the fire, the water, land, ice, air, and life work to rebuild the ecosystem in a renewed form. The human environment that is frequently related to or influenced by fire ecology (ESU #2) serves as a second system that substantially overlaps the more natural system. Managers can't deal with just one factor in either system and expect to understand or manage the fire and its work.

Managing wildland fire is a set of jobs (ESU #7), not just in science but also in policy, management, economics, communication, and many other fields.

People in these fields are aware of the value of fire and its awesome power to reshape the environment (ESU #1). They are also alert to the economic aspects of fire ecology, and to the way fire affects people's aesthetic view of an area. It takes special communication skills to help people deal with an initial sense of loss, and to come to an understanding of the importance of fire in landscape renewal. While aesthetic aspects don't often enter a science curriculum or appear on a proficiency test, it is the feelings of beauty and value people have about Earth that make them strive to use resources wisely.

The science curriculum does include a focus on change over time, and fire is historically and currently a contributor to that (ESU #5). By having students analyze short-term versus long-term change, we complement their understanding of how Earth has come to have its present biological and physical composition, and how humans can have positive or negative roles in future change (ESU #2).



SCIENCE IS A STUDY OF EARTH

A RESOURCE GUIDE FOR SCIENCE CURRICULUM RESTRUCTURE

Developed by Staff and Participants of the
Program for Leadership in Earth Systems Education

The Ohio State University
and
The University of Northern Colorado

Victor J. Mayer and Rosanne W. Fortner, Editors

Under a grant from the National Science Foundation,
Division of Teacher Enhancement

Victor J. Mayer, Principal Investigator
Rosanne W. Fortner and William Hoyt, Co-principal Investigators

April 1995

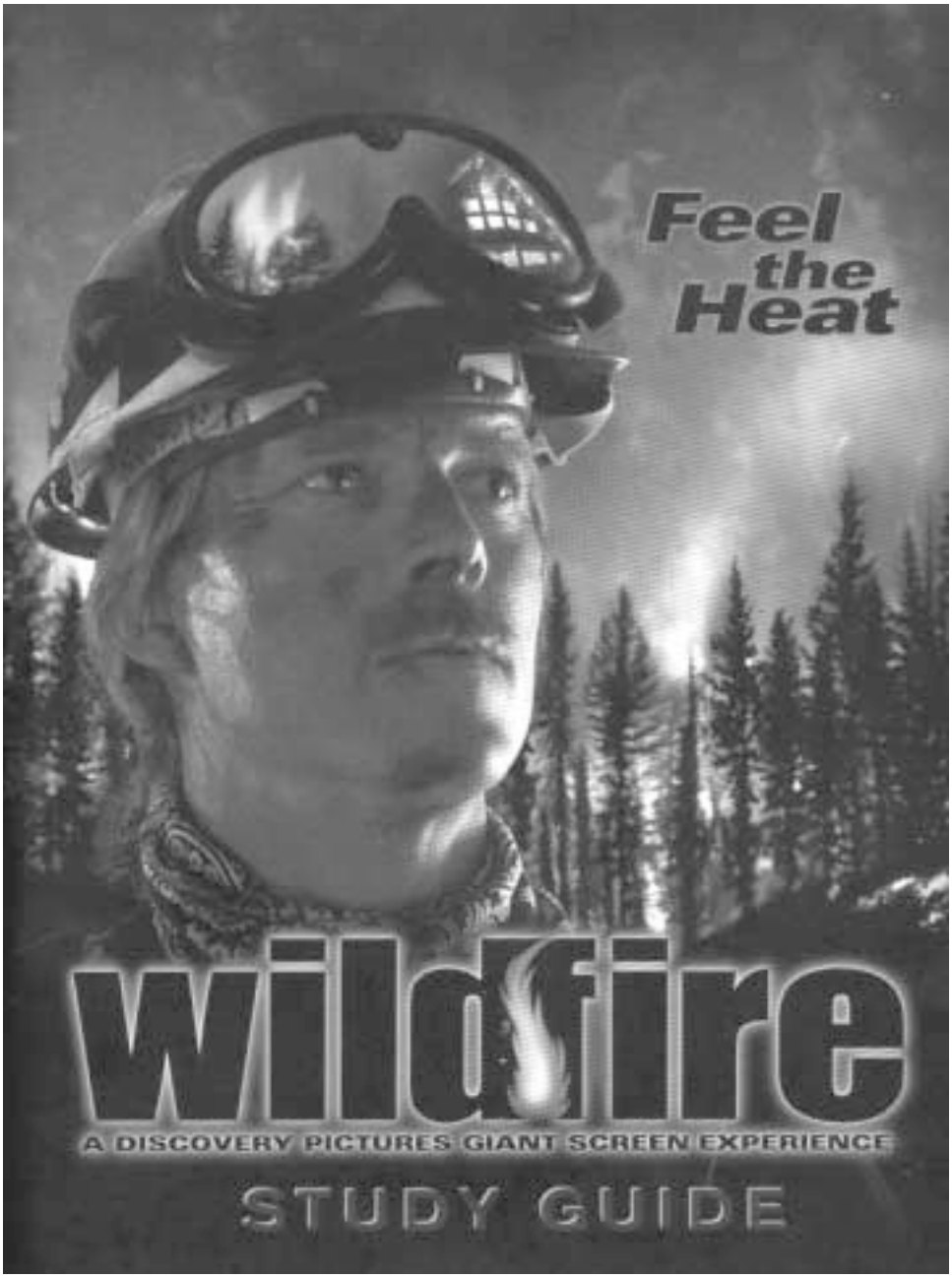
How can wildland fire ecology fit ESU #6? Think of the Earth as a planet. Solar energy is often a neglected aspect of recovery of wildlands after fire, a required component for regrowth. Our planetary temperature is related to how much incoming solar energy is absorbed, reflected, or reradiated. If the sun's energy is blocked by thick smoke over large areas, such as from the fires in Indonesia in 1998, air quality is affected and over time there can be a cooling effect.

Finally, a study of fire ecology and management can provide a rich look at how science processes and technology work (ESU #3). From the chemistry of combustion to the succession of species to the tools for managing fire, the story is one that can enrich science learning with relevant information. An ancillary benefit from the study is one of fostering critical thinking, a key science process that traditional curricula may not address. Decisions are made not only on multiple choice tests but in everyday consideration of larger choices: voting, selection of consumer products, information gathering, health risks, all involve choices that require critical thinking.

Consider the outcomes for teaching people who will be voters in the new century. If the goals of Earth Systems Education are appropriate for the curriculum in the context of the community, wildland fire ecology will fit. ESE encourages thinking about what is really important in science, and it imparts a flexibility to include new ideas with the confidence that educators at many levels in many countries are moving in the direction that represents progress in curriculum restructure.

For more information visit the Bibliography section of the ESE web site, or contact Earth Systems Education Program, School of Natural Resources, The Ohio State University, 2021 Coffey Rd., Columbus, OH 43210.

Author: Rosanne Fortner


Feel the Heat
wildfire
A DISCOVERY PICTURES GIANT SCREEN EXPERIENCE
STUDY GUIDE

Discovery Channel Pictures

In 1999 Discovery Channel Pictures released an IMAX® film, *Wildfire: Feel the Heat* and companion *Study Guide*. The film utilized advisors from a number of sectors including the National Interagency Fire Center (NIFC) and universities. The *Study Guide* was developed by environmental educators from the academic community with significant input by NIFC.

The *Study Guide* contains twelve units and is available from Discovery Pictures, 7700 Wisconsin Ave., Bethesda, MD 20814; (301) 986-0444; web site http://pictures.discovery.com/dppages/wildfire/wildfire.html.

Each unit contains background information for parents and teachers, as well as a wide variety of informative lesson plans for students from kindergarten through eighth grades or equivalent education levels/forms.

The *Study Guide* easily adapts to your learners' specific educational needs. You may use any suggested activity by itself, in combination with other lesson plans suggested in the *Study Guide*, or in tandem with curriculum on ecology, conservation, and social studies.

You are encouraged to modify these units to better meet your learners' needs and to supplement your existing curriculum or unit of study.

While this *Study Guide* contains a wealth of multidisciplinary information, it is intended as a supplement to your curriculum, not as a comprehensive unit. Whether you use these activities on their own or in conjunction with your visit to see the film *Wildfire: Feel the Heat*, the *Study Guide* can improve your learners' understanding of fire safety, wildland fire (both unwanted fires and planned prescribed fire), and natural resource (wildland) management.

You as teachers and parents are encouraged to read the background for all units to gain a broad perspective on wildland fire. Although each unit has been prepared with a specific objective, each activity can be rewritten to meet your program of study. Likewise, student-centered evaluation strategies should be prepared in conjunction with the objectives. State, provincial, or regional education standards, as well as local education guidelines, should be consulted as you prepare to lead these activities.

The contents of the document are:

Unit 1: About this Guide

Grades K–8: WILDFIRE: Feel the Heat Education Chart

Unit 2: Safety First

Grades K–4: Safety First: Be Prepared

Grades 5–8: Safety First: Our Future

Unit 3: Firefighters

Grades K–4: Plan a Field Trip

Grades 5–8: Invite a Wildland Fire Specialist

Unit 4: Tools of the Fire Trade

Grades K–4: Tool Art

Grades 5–8: Inventors Needed

Unit 5: Fire Flashes

Grades 5–8: The Big Three: Heat, Fuel, and Oxygen

Unit 6: Fire Behavior

Grades 5–8: The Matchstick Forest

Unit 7: Fire Ecology

Grades 5–8: Ecology and Wildland Fire

Unit 8: Fire Adaptations

Grades 5–8: Create a Pyrophyte

Unit 9: Rx Fire

Grades 5–8: The Correct Prescription

Unit 10: In Times Gone By

Grades 5–8: Become an Oral Historian

Unit 11: Fire Stories

Grades K–8: Tell Your Story

Unit 12: Just for Fun

Fire Words Puzzle

Fire Word Search and Maze

Puzzle Solutions

Bibliography and Related Resources

Credits and Additional Resources

UNIT 7

FIRE ECOLOGY

LESSON PLAN

Grades 5 - 8:
Ecology and Wildland Fire

MATERIALS

Poster board or flip chart
Large index cards, string, scissors, and markers
Pencil and paper

ACTIVITIES

- Define "ecology" on the board.

- Review what students know about ecological concepts. Terms that should be discussed are:

Abiotic	Food Web
Adaptation	Habitat
Balance	Herbivore
Biotic	Niche
Carnivore	Nutrients
Communities	Omnivore
Decomposers	Photosynthesis
Ecosystems	Succession
Food Chain	

- Review concepts from Units 5 and 6.

- Explain the following concepts:
  Fire Adaptation
  Fire Dependence
  Fire Ecology
  Fire History
  Fire Regime
  Fire Scars
  Wildland Fire

- Create a food web/interdependence game based on a local plant community. Ask students to list plants and animals found in that community.

- Have the students make a name card for one species they named, and hang that species' name card around their neck.

(Continued)

OBJECTIVE

To provide an opportunity to expand or reinforce understanding of basic ecological concepts and apply that understanding to fire ecology.

BACKGROUND

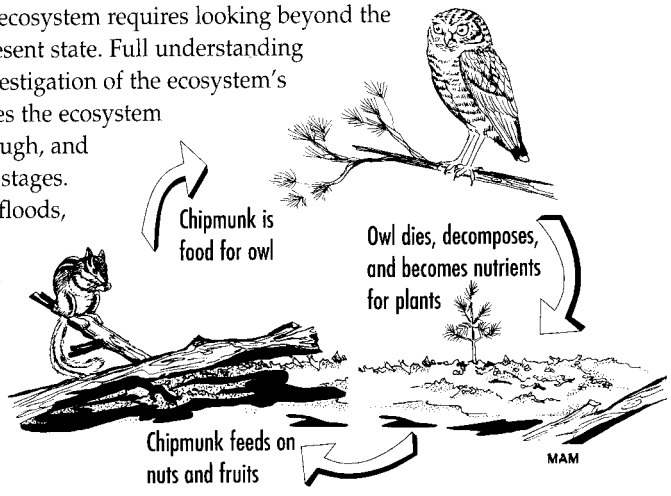
Ecology is the study of the interrelationships among all living organisms **(biotic)** and the nonliving elements **(abiotic)** in and affecting our world. Biotic components, live and die; most abiotic components are in a continuous cycle of building up and being reduced. These ebbs and flows make life possible by seeking a **balance** among all components, living and nonliving.

Most plants utilize nutrients from the soil, air, and water combined in the presence of sunlight to produce food through the process of **photosynthesis**. While **herbivores** eat these plants, **carnivores** eat the herbivores and other carnivores, and **omnivores** eat some of both—forming **food chains**. In the end, **decomposers** break down all that dies, returning it to the land, water, and air (as gases) for plants to again use as **nutrients**. Like a giant spider's web, all of these are linked to form **food webs**.

Each plant and animal has its own niche (the role it plays) in its **habitat** (or life space). Groups of plants and animals find similar habitats suitable; these associations are often called **communities**. A group of communities, including their biotic and abiotic components, that are linked by energy and nutrient flow, are said to be an **ecosystem**.

Communities and ecosystems are constantly changing, evolving through the process of **succession** (one community reacting to and being replaced by another). Many disturbance forces, including fire, impact these changes.

Fire ecology is a branch of ecology that studies the origins of **wildland fire** and its relationship to the living and nonliving environment. Fire is studied as a natural process operating as a component of an ecosystem. To understand an ecosystem requires looking beyond the ecosystem's present state. Full understanding includes an investigation of the ecosystem's origin, the cycles the ecosystem progresses through, and possible future stages. Fire, similar to floods, earthquakes, storms, etc. can be viewed as one means of promoting changes in an ecosystem.



UNIT 7

FIRE ECOLOGY

There are three key concepts important to understanding fire ecology—fire dependence, fire history, and fire regime.

In the 1930s, researchers began to challenge the negative notions about wildland fire and this new thinking, prevails today. They argued that fire was essential to many plant and animal communities. For example, in drier ecosystems around the world where there is not enough moisture to help in the decay of dead plants, fire is required to break down and help recycle the nutrients. This concept is **fire dependence** and applies to natural communities that are **adapted** to and rely on the effects of fire to make the environment more hospitable for that community's plants and animals. For example, fire kills some large plants and prepares the soil for seeding by making nutrients more available for plant uptake. As a result, competition is reduced from other species that would have absorbed needed nutrients or shade out sunlight the new plants require.

Fire history is described as how often fires occur in a given geographical area. Trees actually record fire history. Each year a tree adds a layer of cells, increasing the width of its trunk. When a fire passes through a forest, trees may be only scorched. A layer of charcoal remains on a living tree and, in time, is enveloped by a layer of new growth creating **fire scars**. These fire scars provide a record that scientists can use to determine when in the history of the scarred tree a fire occurred. Fire scarred trees that are petrified often retain these fire scar records as fossilized charcoal or fusain.

The role fire plays in an ecosystem varies with the characteristics under which the ecosystem has evolved. This role is known as **fire regime**. The interactions of humidity, fuels, and ignition sources determine the fire regime for a particular land area. A fire regime is a function of the frequency of fire occurrence, the fire intensity, and the amount of fuel consumed. Both frequency and intensity of fire vary but are interdependent. Frequency of fire is largely determined by the ignition source(s) and the duration and character of weather that favor the spread of fire. Intensity of fire is determined by the quantity of fuels available and the fuels' combustion rates. The interaction between frequency and intensity of fires is influenced by wind and topography. The greater the wind velocity and the steeper the terrain, the more intensely the fire will burn.

Fire ecology is a major subject of study in a number of universities around the world. Students who are interested in becoming a fire ecologist must study physical, chemical, and biological sciences, and mathematics. The study of wildland fire also requires an understanding of the human dimensions of the issue. Students must become proficient in language arts and social sciences. Through creative arts, students gain skills in design, problem solving, and aesthetics. All subjects are important, especially for scientists who work with forces of nature as awesome as **wildland fire**.

Fire ecology is an exciting subject. The more we teach our students about this topic the greater our potential to more effectively manage wildland fire.

LESSON PLAN (Continued)

- Discuss each species' niche and who depends on whom as a food source, for shelter, etc.

- Using one piece of string, connect all of the students to their interdependent partners (students may be connected to a number of other partners).

- Ask students to explain what happens to their species in the case of a wildland fire. Discuss both the positive and negative impacts. (See Unit 9 for additional background information.) Include issues of water and air pollution and impacts on soils. Ask the students what there is more of and what there is less of after a wildland fire.

- Ask students if they wanted to become a fire ecologist or wildland fire manager, what would they need to study in school? What would they study in college? List their responses and reinforce. Stress how each area of academic study (all subjects at their grade level) prepares them for these most important positions.

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Sorenson, Margo. 1996. *Firewatch and Teacher Guide.* Perfection Learning Corporation, 1000 N. Second Avenue, P.O. Box 500, Logan, Iowa, USA 51546-1099.

EDUCATIONAL MATERIALS

"The Fire Education Team" teaching materials for Preschool–Grade 6, The Firehouse, Clovis, CA, email "hrpunky@aol.com".

"Burning Issues", interactive fire science on CD-ROM, Interactive Media Science Projects, Florida State University, 209 Carothers Hall, Tallahassee, FL 32306-4490, (850) 644-8422 (available mid-year 1999).

VIDEOS (VHS)

Raging Planet: Fire. 1998. Discovery Channel Video. Item #713883. Telephone: 1-800-475-6636.

From Beneath the Ashes. 1995. Chicago, IL: Public Media Education. ISBN: 0780015622.

A Legacy of Wildfires. 1990. Rochester, NY: Wards Natural Science Establishment, Inc.

Two Sides of Fire. 1996. Temperate Forest Foundation. 14780 S.W. Osprey Drive, Suite 355, Beaverton, OR 97007, telephone: 503-579-6762.

WEBSITES

- National Fire Protection Association <http://www.nfpa.org/> and for Sparky the Firedog's page <http://www.sparky.org>
- Smokey the Bear's Homepage <http://www.smokeybear.com/>
- USDA Forest Service <http://www.fs.fed.us/> and <http://www.fs.fed.us.R4/sc/fire>
- Discovery Channel School <http://discoveryschool.com>
- Firewise <http://www.firewise.org/>
- U.S. Fish and Wildlife Service <http://www.fws.gov/>
- National Park Service <http://www.nps.gov/>
- Bureau of Land Management <http://www.blm.gov>
- National Wildland Fire Home Page <http://www.nifc.gov>
- Fire Scout <http://www.eskimo.com/~jolem/fire/index.html>
- FireSafe <http://firesafe.org> or <http://firesafe.com>
- Index to Wildland Fire WWW Catalog <http://www.blm.gov/narsc/wildfire/wwwindex.html>
- Canadian Wildfire Network <http://www.denendeh.com/flycolor/wildfire>
- Canadian Wildland Fire Information System <http://www.nofc.forestry.ca/fire/cwfis/>
- British Columbia Ministry of Forests <http://www.for.gov.bc.ca/protect>
- New South Wales <http://www.npws.nsw.gov.au/wildlife/fire.htm>
- New Zealand National Rural Fire Authority <http://www.fireserv.org.nz/rural/onramp/index.htm>
- FireNet (International Fire Information Network) <http://online.anu.edu.au/Forestry/fire/firenet.htm> or <http://www.csu.edu.au/firenet/firenet.html>
- Additional international information <http://www.firesafe.com/international/html>
- For an education search for information and lesson plans <http://www.education-world.com>

Fire Ecology: Resource Management Education

In 1995 federal agencies at the National Interagency Fire Center produced an education unit entitled *Fire Ecology—Resource Management Education Unit*. (Authors: Michele Mazzei-Cox, Gary W. Mullins, Pat Durland, Bill Clark, and Robert Huggins). The document is now out of print but can be found on the National Park Service web site at http://fire.nps.gov/fire/ecology/docs/ecolinit.html or indirectly through the National Interagency Fire Center's site containing numerous web links at http:/www.nifc.gov/preved/. Contents within the web-based document are:

- Teacher Background Information
- Student Background Information
- Activities:
  - Fire Adaptations
  - Hot Questions
  - Fire Feelings
  - Reporting the Blazes
  - Fire Field Trip
  - Fire In My Backyard
- Glossary of Fire Terms
- Fire References
- Teacher Evaluation Form

A primary goal of this fire ecology packet is to help teachers and students become better informed about land management issues and the responsibilities of resource management agencies. These materials can be infused into existing curricula and focus attention on current societal issues such as public land management, management of natural resources, and conflict resolution.

The included exercises are also designed to help educators achieve curriculum objectives of improved writing, verbal, and cognitive skills.

A 15-page "Teacher Background Information" section provides an overview of biological, social, cultural, and management content related to wildland fire. Six units, along with student background materials, are targeted to students who work in the 5–9 grade levels. One unit, "Reporting the Blazes," is included as a sample of this Resource Management Education Unit.

Reporting the Blazes

Teachers' Guide

Students rewrite descriptions of a fire so the reports are less negative about the effects of fire.

Objectives:
Students will learn about sources of public information and how opinions are formed.

Activities:
Define sensationalism. Discuss reporting styles and identify words that may influence the readers'/viewers' opinions about forest fires.

Organization:
Who: Groups of two students
Where: Classroom
Time: 1 hour

Materials:
Pencils, paper

Subjects:
Language Arts, Science

Background

The fires that burned in Yellowstone National Park and throughout the western United States in 1988 brought fire policies of public land managing agencies under close scrutiny. The fires were widely publicized in all forms of media. Consequently, media reports played an important role in forming public opinion about the fires and about how agencies responded to the fires.

In a highly tense situation such as the burning of Yellowstone National Park, a national icon, public concern and emotion increase. Reporters, working in the dramatic setting of an ongoing blaze, collect information from fire-weary officials. Many of the statements made and stories reported reflect the emotion and drama of the moment. Emotion combined with the intensity of the flames and smoke insures a very sensational story.

While the public does have a right to know about emotional, newsworthy events such as fires, the media has the responsibility to report the event accurately. Too often, news reports fail to include the real story of wildland fire, the fire history or recovery rates for different ecological communities (the amount of time required for a plant or animal community to reestablish following a fire).

Much of the omission of ecological science components from media reports is not intentional. The nature of the burning landscape appears very sensational, affecting our emotions. Thus, we focus less on the scientific aspects of the fire and more on the emotion.

Usually ecologists and natural resource managers cannot begin to address the impact of a fire until after the blaze is extinguished. Natural resource managers evaluate if they and the media over-sensationalized the fire and if either provided incorrect or too little scientific data about fire ecology to the public. Communicating to the public what is happening, why it is happening and what potential long-range consequences exist is the manager's goal.

In reviewing the Yellowstone fires of 1988 it is clear that although the fire was spectacular and did damage structures, some of the information provided and some of the information reported was incorrect and/or sensationalized. Conrad Smith explains the reporting of the 1988 Yellowstone fires in the article included in this section.

Activity

Review the background information and Conrad Smith's article with the class. Have the students read the descriptions of a wildland fire in the boxes below. How do the descriptions make the reader feel about fire? Are there words that paint a negative or destructive picture of wildland fire? Are all the effects of a fire mentioned or just the negative effects?

Divide the class into teams of two students. Ask the students to rewrite the descriptions listed on page 5 using words that describe wildland fire as an ecological force instead of a force of devastation.

Discuss particular words that may help make the story seem like a catastrophe. Have your students replace those words with ones that are more factual and descriptive instead of sensationalized. Include a list of words that are more dramatic and another list of more factual words that may be substituted for them. Feel free to alter or expand the list to fit with your expectations and your students' skills.

Discuss the differences between the students' fire descriptions and the ones given. Which ones were more exciting? Explain how audience ratings are important to news programs and to print media, such as newspapers and magazines. Discuss why television networks and print media publishers may decide to use sensationalized reporting techniques to attract more viewers or readers.

Discuss how using more sensational words and omitting certain characteristics of wildland fire can lead people to view fire only as a life-threatening force.

Explain why it is important for each person to review all sides of an issue or story before forming an opinion about the situation. Question 3 on the Quiz requires the teacher to set a scenario for the students and review terms.

Fact-Based Descriptions	**Words that Sensationalize**
• burned vegetation • removed vegetation • burned forest allows a different type of vegetation, such as grasses, to grow.	• devastate • charred • destroyed • blackened moonscape

Some Positive Aspects of Fire	**Some Negative Aspects of Fire**
• lessens fuel loads • opens up new habitat for wildlife • opens up new areas for different types of plants • can rid areas of harmful insects	• kills some wildlife • destroys certain plants • changes views or vistas • may destroy property, such as fences, homes

Media coverage of the 1988 Yellowstone Fires

The Yellowstone wildfires became a 1988 media event, especially in early September as flames approached the Old Faithful geyser and two tourist towns northeast of the park. On 29 different nights, network news viewers saw television stories about monster wildfires, destroyed forests, beleaguered tourists, suffering merchants, brave firefighters, inept public officials, flawed fire policy and—occasionally—about the fiery rebirth of nature. Newspaper stories had more details and usually less hype, but were written in the same spirit.

There were some surprising errors. An August 30 ABC television story contained an interview with a man identified as "Stanley Mott, Director, National Park Service." He appears to be a tourist*. A September 22 *New York Times* story stated categorically it is Park Service policy never to suppress natural fires, and that all fires are suppressed in national forests**. Among 112 newspaper and news magazine stories about the fires for which I contacted named sources, nine percent of those sources said they were misidentified. Ten percent said their names were misspelled. Sources quoted by the *Chicago Tribune, Washington Post and USA Today* said comments attributed to them were fabricated. According to one source, a September 8 *Chicago Tribune* story contained more errors than facts.

> "Journalism, like any other storytelling activity, is a form of fiction ...."
>
> *Robert Manhoff and Michael Schudson,* Reading the News.

Other studies of reporting accuracy have found similar kinds of errors occurring with similar frequency. Journalists correctly argue that mistakes will happen under deadline pressure, especially in the chaos that surrounds any kind of natural catastrophe. The 1988 wildfires were largely inaccessible to reporters, and it was difficult even for experts to obtain accurate figures about the fires' effects. Reporters had difficulty keeping track of whether specific fires were caused by lightning or people, and had difficulty keeping track of whether individual fires had started inside or outside of Park Service jurisdiction. Some even had trouble understanding that the Park Service and Forest Service are separate agencies.

Reporters accustomed to urban structure fires that are extinguished in hours may have had difficulty understanding the inability of authorities to suppress wildfires with equal speed. Local residents who believed all fires could easily have been extinguished if only there had been more bulldozed firebreaks often succeeded in catching reporter's attention. Never mind that wind-borne embers sometimes started spot fires a thousand bulldozer-widths away.

Many Americans were left with the cumulative impression that Yellowstone Park burned down in 1988, and that National Park Service wildfire policy was the reason. This perception persists in spite of the fact that the largest fire was fought from inception, and in spite of the fact that several of the fires started outside the park's jurisdiction where park fire policy did not apply. It persists despite the fact that the fires often burned only the forest floor, leaving many trees untouched. How did this misperception occur?

The literature on science reporting, environmental reporting and disaster reporting indicates that news stories in these contexts usually focus on discrete events rather than interpretation of those events. Stories about delays in construction of the Tellico Dam in Tennessee, for example, focused on the endangered snail darter fish rather than on the related environmental issues. Most reporters are generalists, and natural catastrophe stories are covered in standard ways. There is an event (wildfires), victims (local residents) and cause (government policy). It didn't help that our culture interprets fire as the menacing kind of phenomenon that destroys urban dwellings and chases Bambi from the forest. And it didn't help that the behavior of the 1988 fires confounded experts with

* The man interviewed was William Mott.
**NPS/USFS permits fires to burn under prescribed situations.

decades of experience predicting wildfire behavior. The belief early in August that the fires were under control made their unexpected September runs even more newsworthy.

Just about everyone who ordinarily interprets these kinds of events was caught off guard. Weather predictions based on a century of records were incorrect. Scientifically based predictions about what would burn were incorrect. The public belief that wildfires can be suppressed was incorrect. The normal context for reasoned interpretation simply evaporated under the collapse of so many culturally accepted values. The fires may not have been as ominous and menacing as press accounts implied, but they were impressive. They damaged few structures, but caught the public imagination because of Yellowstone's symbolic value as a national icon.

For more Americans, the media have already interpreted the 1988 Yellowstone wildfires. If journalism is fiction, the fires were a great story. The challenge facing park interpreters is to put the story into an environmental context, and to help the public understand that Yellowstone did not burn down in 1988. It may be possible, one visitor at a time, to undo the inaccurate impressions about what happened in 1988.

Conrad Smith, Assistant Professor of Journalism,
The Ohio State University.

Descriptions of a wildfire found in popular literature or news reports

- Wildfires raged out of control killing all in their path.
- The forest is a blackened pile of ash.
- A forest fire devastates a forest in Montana.
- The fire has left a path of destruction 20 miles wide.
- Fires charred and destroyed 13,000 acres of forest last week.
- Grasslands were consumed by fire yesterday leaving a blackened landscape void of vegetation.
- The wildfire left a blackened moonscape in its wake.

Extension

Ask your students to watch any television news story and write down (1) words that they *would use* if they were the newscaster and (2) sensationalized words that they *would not use*.

Ask your students to make up a newspaper or magazine article about a wildland fire. Student-drawn pictures could accompany the articles. Have students share their articles and pictures with the class and discuss the accuracy/sensationalism of each report.

Ask students to help you create a bulletin board illustrating the positive and negative effects of fire.

Show video tapes of television network news reports about wildland fires. Examine the different reporting styles and the topics examined in the reports. Discuss with the class any similarities and/or differences they see among the different presentations of fire stories.

Important Terms

- Fire history
- Sensationalize

Reporting the Blazes Quiz

NAME _____

1. Name three possible benefits of wildland fires.

_____

_____

2. Name three possible negative effects of wildland fires.

_____

_____

3. If I were a television news reporter "covering" a story on wildland fire in the forest, I would tell my TV viewing audience: (write your own one-minute newscast about a fire that you can imagine).

_____

_____